

CLAIMS

1. A method for production of an  $\alpha$ -glucan from a  $\beta$ -1,4-glucan, comprising:
  - 5        reacting a solution containing a  $\beta$ -1,4-glucan, a primer, a source of phosphoric acid,  $\beta$ -1,4-glucan phosphorylase, and  $\alpha$ -1,4-glucan phosphorylase to produce an  $\alpha$ -glucan.
- 10       2. The method according to claim 1, wherein said  $\beta$ -1,4-glucan is cellobiose, and said  $\beta$ -1,4-glucan phosphorylase is cellobiose phosphorylase.
- 15       3. The method according claim 1, wherein said  $\beta$ -1,4-glucan is a cellooligosaccharide having a degree of polymerization of 3 or more, and said  $\beta$ -1,4-glucan phosphorylase is cellodextrin phosphorylase.
- 20       4. The method according to claim 1, wherein said  $\beta$ -1,4-glucan is a cellooligosaccharide having a degree of polymerization of 3 or more, and said  $\beta$ -1,4-glucan phosphorylase is cellobiose phosphorylase and cellodextrin phosphorylase.
- 25       5. The method according to claim 1, wherein said production step further comprises removing glucose produced as a byproduct from said solution simultaneously with production of said  $\alpha$ -glucan.
- 30       6. The method according to claim 5, wherein said solution further contains glucose isomerase or glucose oxidase.
7. The method according to claim 5, wherein said solution further contains glucose oxidase and mutarotase.

8. The method according to claim 7, wherein said solution further contains catalase or peroxidase.

5 9. The method according to claim 1, wherein said source of phosphoric acid is inorganic phosphoric acid, glucose-1-phosphate, or a mixture of inorganic phosphoric acid and glucose-1-phosphate.

10 10. The method according to claim 1, wherein the concentration of said source of phosphoric acid is 1mM to 50mM.

11. The method according to claim 1, wherein said  $\alpha$ -glucan is amylose.